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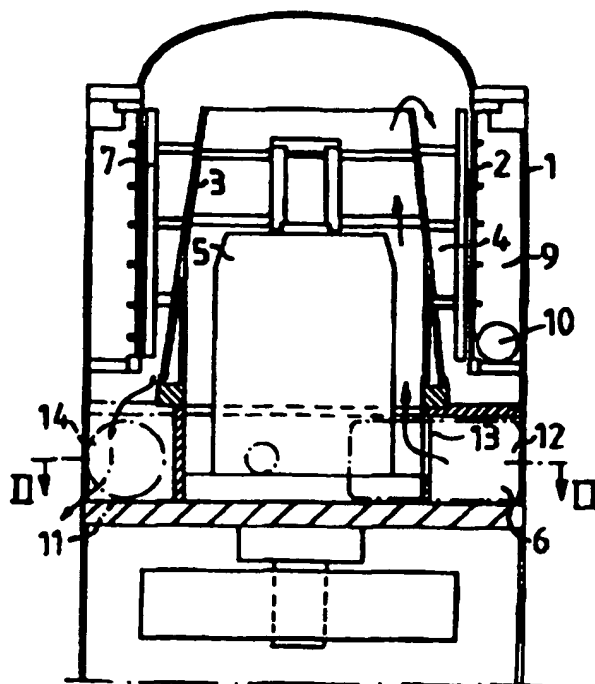
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/SE96/01203 (22) International Filing Date: 26 September 1996 (26.09.96)  (30) Priority Data: 9503536-6 10 October 1995 (10.10.95) SE  (71) Applicant (for all designated States except US): SUNDS DEFI- BRATOR INDUSTRIES AB [SE/SE]; S-851 94 Sundsvall (SE).  (72) Inventor; and (75) Inventor/Applicant (for US only): LAAKSO, Tauno [FI/FI]; Sumatie 9, FIN-37630 Valkeakoski (FI).  (74) Agent: SUNDQVIST, Hans; Sunds Defibrator Industries AB, Strandbergsgatan 61, S-112 51 Stockholm (SE).		(81) Designated States: AU, BR, CA, JP, NO, NZ, US, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i>

(54) Title: SCREENING ARRANGEMENT

(57) Abstract

An arrangement for screening pulp suspensions, comprising a casing (1) with inlet (6) for inject and outlets (10, 11) for accept and reject. Between a rotor (3) in the casing a screening zone (4) is formed. The inject inlet (6), reject outlet (11) and a scrap outlet (8) for coarse and heavy impurities are connected in the same horizontal plane to the lower portion of the casing (1). The connections are offset in relation to each other and defined from each other by walls (15-17).



Screening arrangement

This invention relates to an arrangement for screening pulp suspensions in order to separate impurities and other pulp fractions not desired to be included in the final product, such as coarse particles, undefibered material and poorly worked fibers.

At the making of fiber suspensions, undesired coarse particles, for example undefibered material, bark, knots etc., are obtained in the suspension as a result of incomplete manufacturing processes. Also other heavy impurities, such as sand and scrap etc., can be found in the suspension. These impurities can cause interruptions in the screening process. It is, therefore, desired to separate them at an early stage of the screening. For eliminating the coarse impurities or reduce them in size, special devices, for example knot screens or refiners, can be arranged before the screen. It is also possible to separate the coarse impurities by a first screening step in the screening arrangement or to separate scrap and heavy particles when the suspension enters the screen, and other impurities at the fine screening. In the lastmentioned case, the screening process can be disturbed by the impurities, as mentioned above.

When the coarse impurities in the form of scrap and heavy particles are to be separated at a first screening step in the screening arrangement, special spaces are required in the screening arrangement. This implies increased dimensions of the screening arrangement and thereby a greater space demand for the installation.

The present invention solves this problem in such a way, that the dimensions of the screening arrangement can be limited while the efficiency and capacity of the screening are maintained.

The characterizing features of the invention become apparent from the attached claims.

The invention is described in greater detail in the following with reference to the accompanying drawings illustrating an embodiment of the invention.

- Fig. 1 shows a screening arrangement according to the invention,  
Fig. 2 is a section II-II of the arrangement in Fig. 1,  
Fig. 3 is a section III-III of a detail of the arrangement in Fig. 2,  
Fig. 4 is a section IV-IV of the arrangement in Fig. 2.

The arrangement comprises an airtight casing 1 with a stationary, preferably cylindric screening member 2 with vertical symmetry axis. Within the screening member 2, a drum-shaped rotor 3 is located, which extends along the screening member. The rotor 3 is concentric with the screening member 2, so that between the rotor and screening member an overall screening zone 4 is formed. The rotor 3 is supported by a stationary housing 5 in the rotor.

An inject inlet 6 for the pulp is connected to the casing 1, through which the pulp is supplied from below to the lower interior portion of the rotor 3. The inlet 6 preferably is located tangentially, so that the inject is supplied in the rotation direction of the rotor 3.

The rotor 3 is designed as a drum, through which the pulp suspension supplied is intended to flow upward for transferring the pulp to the upper end of the screening zone 4. On its outside, the rotor 3 is provided with pulsation generating means 7, which extend into the screening zone 4.

An outlet 8 for coarse and heavy impurities, a so-called scrap outlet, is connected to the lower portion of casing 1. The outlet 8 can be adapted for discontinuous or continuous emptying, depending on the expected content of coarse and heavy impurities in the pulp.

A space 9 for collecting the accept is located outside of the screening member 2, from which space the accept is discharged through an outlet 10. The reject passing through the screening zone 4 past the screening member 2 is discharged through an outlet 11.

The inject inlet 6, scrap outlet 8 and reject outlet 11 are all connected to the casing 1 in the same horizontal plane. The connections are offset in the circumferential direction in relation to each other. It is thereby possible to reduce the height of the screening arrangement. The screen design can thereby be compact without affecting negatively the screening process.

The preferably tangential inject inlet 6 is connected to an inject chamber 12 extending through about  $90^{\circ}$  to  $270^{\circ}$  of the casing 1 all the way to the scrap outlet 8. The inject chamber 12 is defined in the circumferential direction by a first wall 15 and a second wall 16. The inject chamber 12 communicates with the interior of the rotor via openings 13 radially inward from the chamber 12.

A reject chamber 14 is located in the circumferential direction after the scrap outlet 8 and defined therefrom by the second wall 16. The reject chamber 14 extends from the second wall 16 to a third wall 17 through about  $60^{\circ}$  to  $120^{\circ}$  of the casing 1 and terminates with the preferably tangential reject outlet 11. The reject chamber 14 communicates upwardly with the screening zone 4 along its entire length.

An inlet 18 for dilution liquid is connected to the casing 1 of the screening arrangement. This inlet can communicate with a dilution chamber 19 located between the first wall 15 and the third wall 17 in the same horizontal plane as the aforementioned connections 6, 8 and 11. This dilution chamber 19 communicates with a space 20 in the rotor 3, which space is formed with openings 21 in the rotor for the supply of dilution liquid to the screening zone 4, preferably in the lower portion of the screening zone. The supply can take place through the means 7.

The pulp to be screened is supplied tangentially through the inlet 6, from where the pulp via the openings 13 flows upward through the rotor 3 at the same time as coarse and heavy impurities are collected in the scrap outlet 8 due to the effect of centrifugal force. The pulp flows from the top of rotor 3 downward through the screening zone 4 where it is screened and split into accept and reject. This splitting is promoted by the pulsation means 7, which produce pressure and speed variations in the pulp suspension which are favourable for the screening. The outgoing reject concentration can be controlled by supplying dilution liquid at the end of the screening.

The reject is moved from the screening zone 4 down into the reject chamber 14, from where it is removed through the reject outlet 11. The accept is taken out via the space 9 through the accept outlet 10.

The invention is not restricted to the embodiments shown and described, but can be varied within the scope of the invention idea.

Claims

1. An arrangement for screening pulp suspensions, comprising a casing (1) with inlet (6) for inject and outlets (10,11) for accept and reject, a screening member (2) located stationary in the casing (1), and a rotor (3) located within the screening member, whereby a screening zone (4) is formed between the rotor and screening member, characterized in that the inject inlet (6), reject outlet (11) and a scrap outlet (8) for coarse and heavy impurities are connected in the same horizontal plane to the lower portion of the casing (1), and the connections are offset in relation to each other and defined from each other by walls (15-17).
2. An arrangement as defined in claim 1, characterized in that the inject inlet (6) is connected tangentially to an inject chamber (12), which extends through 90-270° in the circumferential direction of the casing (1) and is defined in the circumferential direction by a first wall (15) and a second wall (16).
3. An arrangement as defined in claim 2, characterized in that the inject chamber (12) via radially inward directed openings (13) communicates with the interior of the rotor (3) for the supply of the pulp suspension through the rotor (3) to the screening zone (4).
4. An arrangement as defined in claim 1 or 2, characterized in that the scrap outlet (8) is located at the end of the inject chamber (12) at the second wall (16).
5. An arrangement as defined in any one of the preceding claims, characterized in that the reject outlet (11) is connected to a reject chamber (14), which communicates with the screening zone (4) and extends through 60-120° in the circumferential direction of the casing (1) and is defined in the circumferential direction by walls (16,17).

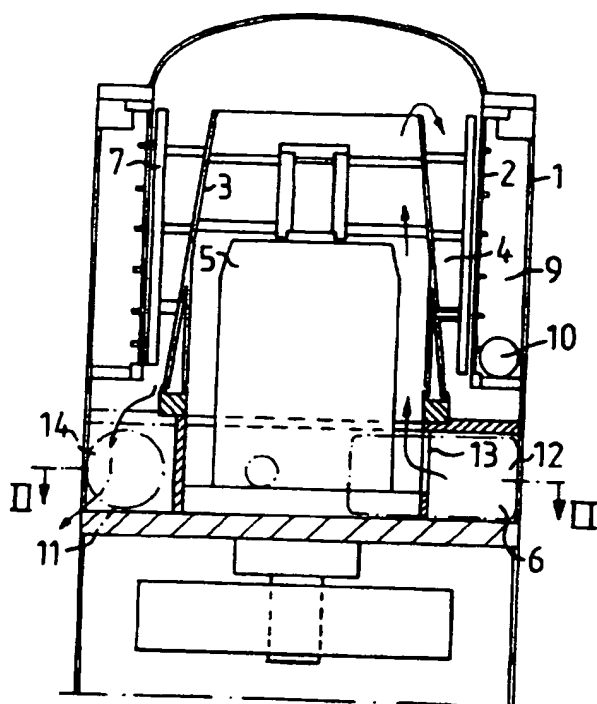


FIG. 1

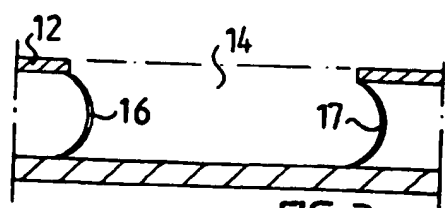


FIG. 3

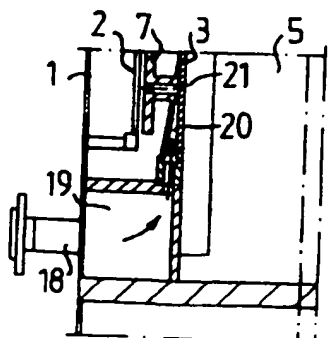


FIG. 4

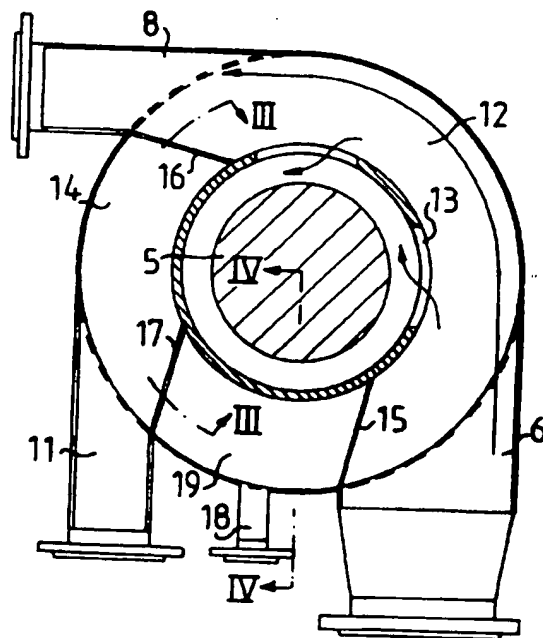


FIG. 2



# INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 96/01203

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: D21D 5/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: D21D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9005807 A1 (SUNDS DEFIBRATOR INDUSTRIES AKTIEBOLAG), 31 May 1990 (31.05.90), page 3, line 1 - line 19  -----	1-5

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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Name and mailing address of the ISA/  
Swedish Patent Office  
Box 5055, S-102 42 STOCKHOLM  
Facsimile No. +46 8 666 02 86

Authorized officer

Jan Carlerud  
Telephone No. +46 8 782 25 00